REMARKS

The applicant respectfully requests reconsideration of claims 27-55 in view of the foregoing amendment, and consideration of new claims 56-78. In the claims presented initially in this application:

a. Claim 27 is amended to define delivery of the angiogenic growth factor with the element penetrated into heart tissue.

b. Claim 28 is amended to define angiogenic agent delivery after causing the penetrating element to penetrate heart tissue.

c. Claim 36 is amended to define a catheter having a distal end and adapted to support the delivery device at the distal end.

d. Claim 53 is amended to provide that inserting the device comprises inserting a distal end of a catheter into a chamber of the heart, and that the catheter supports the device at the distal end.

Now, with respect to the matters raised in the present action:

A. Claims 36, 37 and 53-55 have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is submitted that in view of the amendments to claims 36 and 53, claims 36-37 and 53-55 meet the requirements of 35 U.S.C. § 112, second paragraph.

B. Claims 27, 28, 31-35, 39-42 and 51-55 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 5,634,936 (Linden et al.).

The Linden patent discloses a septal defect closure device made of a polymeric self-hardening material. The device can be either permanent or biodegradable. If desired, the device can be impregnated with growth factors, to encourage tissue ingrowth to assist in closing the septal defect. A variety of versions are shown, including plugs, sleeves, balloons surrounding filler material, and mesh sleeves. The present action relies primarily on the mesh sleeve embodiment shown in Figures 17-22. This embodiment, i.e. mesh or mesh sleeve 512, is the

version that incorporates structure that might be compared to the claimed element penetrated into heart tissue - namely, attachment means 516.

Linden describes the attachment means as taking the form of hooks, advising that the hooks may be comprised of high modulus material such as poly-1-glycolide, crosslinked collagen, Dacron, high density polyethylene fibers, chitin, or metals such as stainless steel (column 10, lines 41-47).

The mesh sleeve itself can be formed of PET, PTFL, or of a biodegradable materials such as caprolactone, polylactic acid, or their combination. Other suggested biodegradable materials include fibers of polylactic acid, polyglycolic acid, collagen, chondroitin sulfate, or a coweaving of these materials (column 11, lines 21-27).

When mesh 512 is attached using attachment means 516 there is penetration of tissue, as seen in Figure 20. As an alternative to the attachment means, mesh 512 can be attached by chemical means (column 10, lines 61-64; column 11, line 14).

Claim 27 defines a process for delivering an angiogenic growth factor to the heart, including penetrating an element of a delivery device into heart tissue, and with the element penetrated, delivering an angiogenic growth factor to the tissue through the element.

As for penetrating an element into heart tissue, the penetration of Linden's attachment means 516 into tissue, as shown in drawing figure 20, might be likened to the claimed feature. Claim 27 requires, further, the delivery of an angiogenic growth factor to the tissue through the element with the element so penetrated. Thus, the angiogenic growth factor is released at a depth within the heart tissue.

This latter feature is not taught in Linden. Regardless of any extent to which the growth factors, mitogenic factors, and other agents used by Linden to promote tissue growth might be compared to the claimed angiogenic growth factor, these agents are provided on or in the mesh or mesh sleeve, not the attachment means. Linden discloses the attachment means as a component separate and distinct from the mesh sleeve, disclosing different lists of materials for these components as noted above. Further, Linden teaches a chemical attachment alternative in which there is no attachment means 516, and thus no penetration into heart tissue. The growth-

promoting agents are provided in the same manner, regardless of whether the mesh is attached mechanically or chemically.

Linden's purpose of promoting tissue ingrowth is to more effectively close a septal defect (column 10, lines 16-21; column 11, lines 8-11). This purpose does not involve a motive to penetrate heart tissue to deliver the growth promoting agents, or to otherwise deliver agents at a depth within heart tissue. Linden's purpose is furthered by providing growth-promoting agents along the mesh or mesh sleeve 512, but would not be furthered by providing such agents to tissue through attachment means 516 when penetrated in tissue.

Accordingly, it is submitted that the process of claim 27 is not anticipated by Linden.

Claims 32-35 depend on claim 27, and are patentable for the reasons given in support of claim 27.

Claim 28 defines a process for treating the heart of a patient, including providing a catheter with a tissue penetrating element disposed at its distal end; inserting at least the distal end into a heart chamber; causing the penetrating element while in the heart chamber to penetrate heart tissue; and after causing such penetration, delivering an angiogenic agent from the penetrating element to surrounding cardiac tissue.

Although the mounting of mesh 512 with attachment means 516 in Linden might be compared to causing a penetrating element to penetrate heart tissue, there is no indication in Linden that an angiogenic agent might then be delivered from the attachment means to the surrounding cardiac tissue. Thus, Linden fails to anticipate the process of claim 28, for the reasons given above in support of claim 27.

Claims 39-42 depend on claim 28, and are allowable along with claim 28.

Claim 31 is drawn to a process for delivering an angiogenic agent to the heart, including providing a device having an element adapted to penetrate cardiac tissue; inserting the device into a heart, and causing the element to penetrate tissue inside the heart; and delivering an angiogenic agent through the penetrated element into surrounding tissue.

Regardless of the extent to which Linden's mesh 512 and attachment means 516 might be likened to the device and element of claim 31, there is no teaching of delivering an angiogenic

agent through the penetrated element into surrounding tissue. Accordingly, claim 31 is allowable for the reasons given in support of claim 27.

Claims 51-55 depend on claim 31 and are allowable for the reasons given in support of claim 31.

C. Claims 29, 30, 43 and 47 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 5,387,419 (Levy et al.).

Levy describes a system that provides a controlled release of antiarrhythmic agents. The system includes a biocompatible polymeric matrix that also may be bioabsorbable if desired, and a therapeutic agent incorporated into the matrix. A substrate comprising the matrix and the incorporated agent is placed in contact with the heart muscle, either at the epicardium, the endocardium, or through the pericardium (column 5, lines 40-48).

Levy teaches a variety of configurations for the substrate, including: a film or patch as shown in Figure 7, polymer-coated wires, rigid screw-threaded structures, and expandable (umbrella) systems with anchoring prongs. See column 7, lines 3-16. The film or patch, coated wires, and screw-threaded structure are disclosed as substrate configurations for cardiac applications including an epicardial design for direct attachment to the surface of the heart (column 7, lines 6-8). For intravascular placement via a cardiac catheter, Levy suggests the detachable screw-threaded catheter tip or the expandable (umbrella) system (column 7, lines 11-14). Finally, Levy advises that other configurations can be devised for intramyocardial placement via a stab wound with a sharp trocar (column 7, lines 16-18).

Claim 29 defines an apparatus for locally modifying electrical action within the heart. The apparatus includes a biocompatible, electrically inactive device including an element for penetrating cardiac tissue to secure the device at a site in the heart, to modify electrical action in the cardiac tissue at the designated site. A catheter is releasably coupled to the device to allow use of the catheter to deliver the device, and withdrawal of the catheter after securing the device.

Levy fails to teach a biocompatible, electrically inactive device that includes an element for penetrating cardiac tissue to secure the device at a site in the heart to modify electrical action in the tissue.

To establish anticipation, it is incumbent upon the examiner to produce a reference that discloses every element of the allegedly anticipated claim. With reference to the aforementioned feature of claim 29, the undersigned attorney has reviewed the Levy patent, completely but with particular attention to the portions cited by the examiner, and finds no explicit teaching that any of its substrates penetrates cardiac tissue. If the examiner has found an explicit teaching in Levy of a substrate that penetrates cardiac tissue, the examiner is respectfully requested to point out the location of this teaching.

In the absence of an explicit teaching of cardiac tissue penetration, "inherent" anticipation is present if an element that penetrates cardiac tissue is the inherent result of, or is necessarily present based on, subject matter disclosed in the reference. Levy does not contain subject matter that meets this requirement.

With reference to the portions of Levy cited by the examiner, the text in column 2, lines 38-47 neither mentions tissue penetration, nor contains any subject matter suggestive of tissue penetration.

Column 3, lines 18-46 likewise lacks such subject matter. The reference to a form that "may be attached to the heart muscle in some manner such as a patch of film, coated wires, anchorable catheter tip, etc." (column 3, lines 43-47) does not meet the requirement of inherency, because "attached to" does not require penetration. Nor, is an "anchorable" catheter tip one that requires tissue penetration.

Column 5, lines 46-48 recites "direct contact" of the dosage form with the heart muscle," which again does not require tissue penetration.

Finally, at column 7, lines 3-43 Levy discusses various configurations for the substrate. Considering these substrates individually:

1. The film or patch clearly does not involve penetration. See -Figure 7.

2. Polymer-coated wires do not inherently penetrate tissue. As if to underscore this point, Levy discloses these wires as one of three configurations for attachment to the epicardial surface.

3. The rigid screw-threaded molded polymeric structure likewise does not inherently penetrate tissue, particularly when - like the coated wires - it is disclosed as one of the epicardial surface attachment configurations.

4. The detachable screw-threaded catheter tip is disclosed for intravascular placement via a cardiac catheter. Levy does not illustrate the catheter tip, nor does Levy discuss whether the tip is "screw-threaded" at a distal end intended for tissue contact, or at a proximal end intended for threaded coupling to the cardiac catheter. Even assuming the distal end location, tissue penetration is not an inherent result, given Levy's teaching of screw-threaded structures intended for epicardial surface attachment.

5. Finally, Levy suggests an expandable (umbrella) system with anchoring prongs. This configuration, like the others, does not inherently involve tissue penetration to secure a device.

With further reference to item 5, selected pages (cover page, drawing sheet 6 and columns 13/14) of U.S. Patent No. 6,652,556 are attached as Exhibit A. Figures 19-21, and the text beginning at column 13, line 44, illustrate and describe an umbrella system in which struts 160 secure a pole 170 and filtering membrane 40 without penetrating tissue. In fact, these struts are intended "not to puncture the left atrial appendage 13" (column 13, lines 61-62). Thus, struts or prongs of umbrella attachment systems do not inherently penetrate tissue.

If the examiner has found any subject matter in Levy, from which a tissue penetrating substrate is the inherent result, the examiner is respectfully requested to point out the location of that subject matter.

Further, regardless of the substrate configuration, there is no suggestion in Levy that the substrate, or any part of it, is adapted to modify electrical action in cardiac tissue when secured to the tissue. Rather, cardiac rhythm disturbances are treated with therapeutic agents incorporated into the substrates for release in situ.

Finally, Levy does not teach any advantage in, or desire for, delivery of therapeutic agents from an element penetrated in cardiac tissue rather than in surface contact with the cardiac tissue. Claim 29, of course, does not mention therapeutic agent delivery, although several claims that depend on claim 29 involve delivery of a pharmacological agent. Levy's lack of disclosure

in this regard is pertinent to claim 29 nonetheless, because it underscores the absence of a motive for a person skilled in the art to fashion any of Levy's configurations for penetration of cardiac tissue.

Accordingly, it is submitted that claim 29 is not anticipated by Levy.

Claim 43 depends on claim 29, and is patentable for the reasons given in support of claim 29.

Claim 30 defines an apparatus for delivering a pharmacological agent to the heart, including a catheter body adapted to convey a pharmacological agent toward its distal end, and a tissue penetrating structure releasably coupled to the distal end of the catheter body and adapted to deliver a pharmacological agent from the catheter body into heart tissue.

Levy, due to its failure to explicitly or inherently teach a tissue penetrating structure, fails to anticipate the apparatus defined in claim 30 for the reasons given above in support of claim 29.

In addition, Levy fails to teach or suggest the claimed catheter body. While Levy discloses catheters for intravascular placement of its agent-impregnated substrates, the agents are provided to the heart entirely by the substrates themselves. There is no disclosure of a need for, or advantage in, a catheter adapted to convey a pharmacological agent toward its distal end, then to a substrate at the distal end.

Thus, the Levy patent fails to anticipate claim 30.

Claim 47 depends on claim 30 and is patentable along with claim 30.

D. Claims 27-55 stand rejected under the judicially created doctrine of obviousness-type double patenting, as allegedly unpatentable over claims 21, 22, 24-26, 50-57, 62-68, 74, 75, and 77 of U.S. Reissue Patent No. RE37,463.

In connection with this rejection, it is asserted in the present action that the conflicting claims of the application and the '463 patent are not patentably distinct from each other. The applicant, respectfully, does not acquiesce in this assertion. This notwithstanding, the term of a patent based on this application would be set to expire concurrently with the expiration of the '463 patent. Accordingly, the filing of a terminal disclaimer is acceptable in light of its negligible impact on the patent term.

Accompanying this amendment is a terminal disclaimer, signed on behalf of the owner of U.S. Patent No. RE37,463 and the present application. This is believed to overcome the double patenting rejection.

To summarize, it is submitted that claims 27-55 in view of the present amendment, and new claims 56-78, incorporate subject matter patentable over the prior art of record, and define that subject matter with the clarity and precision required by 35 U.S.C. § 112, second paragraph. An early and favorable action allowing these claims is respectfully requested.

Respectfully submitted,

Biocardia, Inc.

Dated: January 28, 2004

By: _____
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CERTIFICATE OF MAILING

Pursuant to 37 CFR 1.8, I hereby certify that this Amendment in Application Serial No. 10/014,445 is being deposited with the U.S. Postal Service by first class mail, postage prepaid, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date of deposit indicated below.

Date of Deposit: January 28, 2004

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Geralyn M. Vita

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